GLY 4200C Name_____

Laboratory Midterm - Closed Book October 15, 2012

8 points

17 students took quiz - red numbers indicate times question was missed

1. What is the coordination number of a cation in each of the following configurations? (5 points total)

	Configuration	CN
1	Cubic	VIII
0	Octahedral	VI
1	Square Planar	IV
0	Linear	II

2. What do each of the symbols mean? (1 point each)

0 i Inversion center

1 A_3 Three-fold rotation axis

13 3. If an object has four three-fold axis, three two-fold axes, and an inversion center, how many mirror planes does it have? Three (1 point)

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May Use Crystal Class Sheet 32 points

1. Examine each model. Determine all of the symmetry elements present. List the number of each type of element in the table below. For the inversion center, indicate YES (it is present) or NO (it is not present). Then indicate the crystal class to which the object belongs. You will receive one-half point for each symmetry element correctly listed (number and type). One-half point will be subtracted for elements listed which are not present. You will receive one point for each crystal class correctly listed. (Total 24 points) A_2 through inversion center, ½ point each; Crystal class, 1 point each

Important: From each category, you must choose one model to examine. Be sure to write the object number in the second column.

Choose one Model from each group	A_2	A_3	A_4	A_6	Mirror Planes	Inversion Center	Crystal Class H-M Symbol	Points Missed
3 or 6	6 2	4 0	3 1	0 1	9 2	+ 1	4/m $\bar{3}$ 2/m 3	6.5
8 or 9	3 5	4 8	0 0	0 0	6 10	- 5	$\bar{4}$ 3/m 10	49.0
14 or 16	6 2	0 2	0 0	1 2	7 2	+ 1	6/m 2/m 2/m 2	6.5
24 or 27	3 4	0 2	0 4	0 0	3 6	+ 1	2/m 2/m 2/m 6	14.5
43	1 4	0 1	0 0	0 0	2 4	- 2	mm2 6	11.5
49	0 2	0 1	1 2	0 0	4 2	- 0	4mm 3	6.5

1 2. Examine Model E. Is it HCP or CCP? (2 points) a) HCP

3 What types of voids are present between the layers? b) Tetrahedral

8 and c) Octahedral (½ point each)

11 What is the ratio of b voids to c voids (b/c)? 2:1

(1 point)

3. Examine Models F, G, and H. Identify the configurations. (1 point each)

1 F. Square Planar

0 G. Linear

5 H. Tetrahedron

5 I. Trigonal Planar

Lab Midterm Results

39.0 - 3 A+
38.0
37.5 - 2 A
35.0 B+
34.0 - 2 B **MEDIAN = 34.0**
32.5 **MEAN = 33.5 (83.8%, B)**
32.0 B-
31.5
31.0 - 2 C+
30.0
29.5 C
19.5 F

2010 Lab Quiz 2 = 78.8% (High = 37, Low =23)
2011 Lab Quiz 2 = 77.4% (High = 40, Low = 16.5)

LAB Grade at Midterm (210.0 possible)

201.3
198.1 A
194.2
192.4 A-
187.7
185.6
184.0
183.1 B+
181.7 **MEDIAN = 181.7**
180.5 **MEAN = 180.0 (85.7%, B)**
178.3
178.2
174.8 B
168.6 B-
167.0
164.7 C+
140.6 D+

2010 average after lab 6 was 82.5%
2011 average after lab 6 was 82.8%